

What is claimed is:

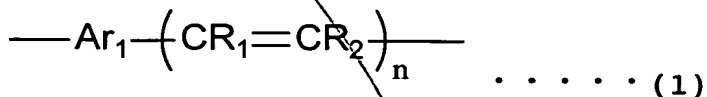
1. A polymeric fluorescent substance which emits a fluorescence in solid state and having a number-average molecular weight of 10^3 to 10^8 in terms of polystyrene, wherein the substance contains each one or more of repeating units represented by the following formula (1) and formula (3), respectively, and these repeating units are so selected as to satisfy the following conditions (a) to (c):

(a): the total amount of the repeating units represented by the formulae (1) and (3) is 50 mol% or more of the amount of the whole repeating units,

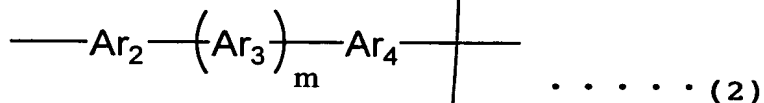
(b): the amount of the repeating unit represented by the formula (3) is more than 0.1 mol% and less than 9 mol% based on the total amount of the repeating units represented by the formula (1) and formula (3), and

(c): when the absorption edge wavelength of a polymer solely composed of a repeating unit represented by the formula (1) is represented by λ_1 (nm) and the absorption edge wavelength of a polymer solely composed of a repeating unit represented by the formula (3) is represented by λ_2 (nm), the following relation is satisfied:

$$1239/\lambda_1 \geq 1239/\lambda_2 + 0.05$$

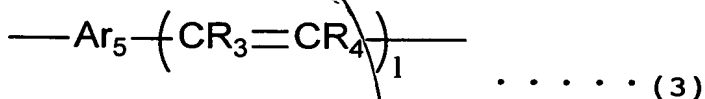


in the formula, Ar₁ is a group represented by the following formula (2); R₁ and R₂ each independently represents a group selected from the group consisting of a hydrogen atom, alkyl group having 1 to 20 carbon atoms, aryl group having 6 to 60 carbon atoms, heterocyclic compound group having 4 to 60 carbon atoms and cyano group; and n is 0 or 1,



in the formula, Ar₂ to Ar₄ each independently represents an arylene group having 6 to 60 carbon atoms contained in the main chain, or a heterocyclic compound group having 4 to 60 carbon atoms contained in the main chain; at least one of Ar₂ to Ar₄ is a group other than a 6-membered ring, or at least one of Ar₂ to Ar₄ has a substituent other than a hydrogen atom; when a plurality of substituents are carried, they may be the same or different; adjacent rings may be mutually connected directly or via a substituent to form a ring; m is an integer from 0 to 3; wherein, Ar₂ and Ar₄ constitute a structure wherein if Ar₂ moves in parallel to the polymer main chain, it does not completely overlap Ar₄,

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in the formula, Ar₅ represents an arylene group having 6 to 60 carbon atoms contained in the main chain, or a heterocyclic compound group having 4 to 60 carbon atoms contained in the main chain; R₃ and R₄ each independently represents a group selected from the group consisting of a hydrogen atom, alkyl group having 1 to 20 carbon atoms, aryl group having 6 to 60 carbon atoms, heterocyclic compound group having 4 to 60 carbon atoms and cyano group; 1 is 0 or 1.

2. A polymeric fluorescent substance which emits a fluorescence in solid state and having a number-average molecular weight of 10³ to 10⁸ in terms of polystyrene, wherein the substance contains each one or more of repeating units represented by the following formula (1), formula (3) and formula (4), respectively, and these repeating units are so selected as to satisfy the following conditions (d) to (f):

(d): the amount of the repeating unit represented by the formula (1) is 10 mol% or more of the amount of the whole repeating units, and the total amount of the repeating units represented by the formula (1), formula (3) and formula (4) is 50 mol% or more of the amount of the whole repeating units,

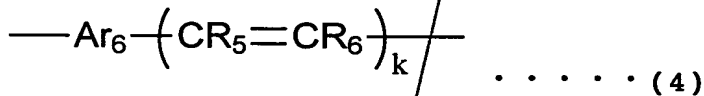
(e): the amount of the repeating unit represented by the formula (3) is more than 0.1 mol% and less than 9 mol% based on the total amount of the repeating units represented

by the formula (1), formula (3) and formula (4), and

(f): when the absorption edge wavelength of a polymer solely composed of a repeating unit represented by the formula (1) is represented by λ_1 (nm), the absorption edge wavelength of a polymer solely composed of a repeating unit represented by the formula (3) is represented by λ_2 (nm) and the absorption edge wavelength of a polymer solely composed of a repeating unit represented by the formula (4) is represented by λ_3 (nm), the following relations are satisfied:

$$1239/\lambda_1 \geq 1239/\lambda_2 + 0.05$$

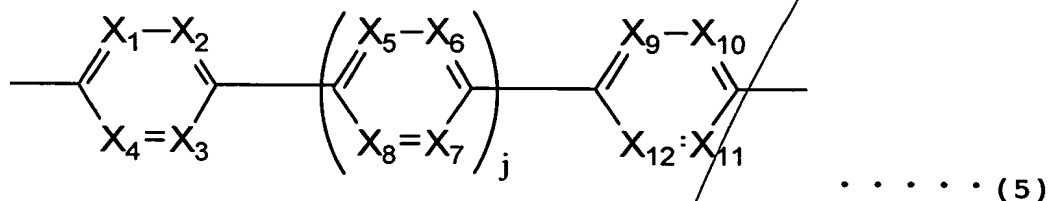
$$1239/\lambda_3 \geq 1239/\lambda_2 + 0.05$$



in the formula, Ar_6 is an arylene group having 6 to 60 carbon atoms contained in the main chain, or a heterocyclic compound group having 4 to 60 carbon atoms contained in the main chain; R_5 and R_6 each independently represents a group selected from the group consisting of a hydrogen atom, alkyl group having 1 to 20 carbon atoms, aryl group having 6 to 60 carbon atoms, heterocyclic compound group having 4 to 60 carbon atoms and cyano group; and k is 0 or 1.

3. The polymeric fluorescent substance according to Claim 1 wherein the group represented by said formula (2)

is a group represented by the following formula (5):



in the formula, X_1 to X_{12} each independently represents C- R_7 or N, and at least one of X_1 to X_{12} is C- R_7 ; wherein, R_7 represents a group selected from the group consisting of a hydrogen atom, alkyl group having 1 to 20 carbon atoms, alkoxy group having 1 to 20 carbon atoms, alkylthio group having 1 to 20 carbon atoms, alkylsilyl group having 1 to 60 carbon atoms, alkylamino group having 1 to 40 carbon atoms, aryl group having 6 to 60 carbon atoms, aryloxy group having 6 to 60 carbon atoms, arylalkyl group having 7 to 60 carbon atoms, arylalkoxy group having 7 to 60 carbon atoms, arylalkenyl group having 8 to 60 carbon atoms, arylalkynyl group having 8 to 60 carbon atoms, arylamino group having 6 to 60 carbon atoms, heterocyclic compound group having 4 to 60 carbon atoms and cyano group; at least one R_7 is a group other than a hydrogen atom; when a plurality of R_7 's are present, they may be the same or different; the group represented by the formula (5) has at least one substituent other than a hydrogen atom, and when the group (5) has a plurality of substituents, they may be the same or different;

adjacent 6-membered rings may be mutually connected directly or via a substituent to form a ring; j is an integer from 0 to 3; wherein, X_1 and X_9 , X_2 and X_{10} , X_3 and X_{11} , and X_4 and X_{12} are not respectively the same simultaneously, and X_1 and X_{12} , X_2 and X_{11} , X_3 and X_{10} , and X_4 and X_9 are not respectively the same simultaneously.

4. The polymeric fluorescent substance according to Claim 3 wherein $j=0$ in said formula (5).

5. A polymer light emitting device comprising a pair of electrodes composed of an anode and a cathode at least one of which is transparent or semitransparent and at least one light emitting layer disposed between the electrodes, wherein the polymeric fluorescent substance of any of Claims 1 to 4 is contained in said light emitting layer.

6. The polymer light emitting device according to Claim 5 wherein a layer containing an conducting polymer is disposed at least between one electrode and the light emitting layer so that the layer containing an conducting polymer is adjacent to said electrode.

7. The polymer light emitting device according to Claim 5 wherein an insulation layer having a thickness of 2 nm or less is disposed at least between one electrode and the light emitting layer so that the insulation layer is adjacent to said electrode.

8. The polymer light emitting device according to any

of Claims 5 to 7 wherein a layer comprising an electron transporting compound is disposed between the cathode and the light emitting layer so that the layer comprising an electron transporting compound is adjacent to said light emitting layer.

9. The polymer light emitting device according to any of Claims 5 to 7 wherein a layer comprising a hole transporting compound is disposed between the anode and the light emitting layer so that the layer comprising a hole transporting compound is adjacent to said light emitting layer.

10. The polymer light emitting device according to any of Claims 5 to 7 wherein a layer comprising an electron transporting compound is disposed between the cathode and the light emitting layer so that the layer comprising an electron transporting compound is adjacent to said light emitting layer, and a layer comprising a hole transporting compound is disposed between the anode and the light emitting layer so that the layer comprising a hole transporting compound is adjacent to said light emitting layer.

11. A flat light source obtained by using the polymer light emitting device of any of Claims 5 to 10.

12. A segment display obtained by using the polymer light emitting device of any of Claims 5 to 10.

13. A dot matrix display obtained by using the polymer light emitting device of any of Claims 5 to 10.

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14. A liquid crystal display ~~obtained by using the~~
polymer light emitting device of any of Claims 5 to 10 as
~~a back-light.~~

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